

What is claimed is:

1. A monochromator comprising:

an optical ray input section which limits the width of optical rays input from a light source,

a first concave mirror for converting the optical rays passing through the optical ray input section into parallel rays,

a diffraction grating for separating the parallel rays by wavelength into diffracted rays,

a second concave mirror for condensing the diffracted rays when the diffracted rays are input,

an optical ray output section which limits a wavelength band width of the condensed rays, and

a substrate to which the optical ray input section, the first concave mirror, the diffraction grating, the second concave mirror, and the optical ray output section are fixed;

wherein a coefficient of linear expansion of a focal length of the first concave mirror, a coefficient of linear expansion of a focal length of the second concave mirror, and a coefficient of linear expansion of a material forming the substrate are approximately the same.

2. The monochromator according to claim 1, wherein, when a width of the optical ray output section is  $d$ , a focal length of each of the first and second concave mirrors when assembling the monochromator is  $L$ , a difference between an ambient temperature when operating the monochromator and the temperature when assembling the monochromator is  $\Delta T$ , and a numerical aperture of the concave mirror is  $a$ , the absolute value of difference between the coefficient of linear expansion of the material forming the substrate and the coefficients of linear expansion of the material of the first and second concave mirrors is the absolute value of  $d/(4aL\Delta T)$  or less.

3. The monochromator according to claim 1, wherein a difference between the coefficient of linear expansion of the material forming the substrate and the coefficients of linear expansion of the focal lengths of the first and second concave mirrors is  $10 \times 10^{-6} / ^\circ\text{C}$  or less.

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4. The monochromator according to claim 1, wherein the material forming the substrate is a composite of aluminum and ceramic.
5. The monochromator according to claim 1, wherein at least one of the optical ray input section and the optical ray output section is a slit.
6. A monochromator comprising:  
 a slit to limit a width of optical rays input from a light source,  
 a concave mirror to convert the optical rays passing through the slit into parallel rays,  
 a diffraction grating to separate the parallel rays into diffracted rays by wavelength,  
 and  
 a substrate to which the slit, the concave mirror, and the diffraction grating are fixed;  
 wherein the concave mirror condenses the diffracted rays when the diffracted rays are input, and the slit limits a wavelength band width of the condensed rays;  
 wherein a coefficient of linear expansion of a focal length of the concave mirror and a coefficient of linear expansion of a material forming the substrate are approximately the same.
7. The monochromator according to claim 6, wherein a difference between the coefficient of linear expansion of the material forming the substrate and the coefficient of linear expansion of the focal length of the concave mirror is  $10 \times 10^{-6} / ^\circ\text{C}$  or less.
8. The monochromator according to claim 6, wherein the material forming the substrate is a composite of aluminum and ceramic.
9. An optical spectrum analyzer comprising the monochromator according to claim 1.
10. An optical spectrum analyzer comprising the monochromator according to claim 6.

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